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## Research Project Title

Guidelines for the Use of Expanded-Polystyrene (EPS) Block Geofoam as Lightweight Backfill Behind Retaining Walls

## Purpose of the Project

The purpose of the project is to develop a design guideline for the use of geofoam as lightweight backfill material behind retaining walls and abutments.

## Scope and Significance

The scope of the research project will consist of the following primary tasks: (1) Develop an instrumentation special provision, (2) Perform literature search and develop a provisional design guideline, (3) Perform seismic analysis, (4) Install field instrumentation, (5) Monitor instrumentation, (6) Summarize and analyze field instrumentation data, (7) Perform laboratory creep testing, (8) Develop design guideline and material special provision for use of geofoam in embankments, earth-retention systems and bridge abutments, (9) Prepare a final project report, and (10) Provide a one-day workshop to TDOT personnel.

## Expected Outcomes

The primary benefit of the proposed recommended design guideline for design of geofoam earth-retention systems and bridge abutments and the recommended material and construction special provision that will be developed as part of this research is that TDOT engineers will have guidance on performing designs of geofoam earth-retention systems and bridge abutments. The world-wide experience with the use of geofoam demonstrates that geofoam can provide economical construction alternatives to construction of embankments, earth-retention systems, and bridge abutments. Thus, the geofoam design guidance that will be developed as part of this research will also contribute to economical earth-retention systems and bridge abutments in Tennessee.

## Time Period

The time period for the project is December 1, 2019 to November 30, 2020. However, the project schedule is highly dependent on the construction schedule of the Poplar Avenue bridge replacement project and when the geofoam walls will be placed because a key task of the research project is to monitor the performance of the geofoam wall with field instrumentation for a period of up to one year.

## Contact Information

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